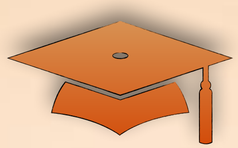
The Complete C# Developer Course



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Advanced C# Part 3

- ✓ Recursive methods
- ✓ Methods parameters
- ✓ Params
- ✓ Extension methods
- ✓ Delegates
- ✓ Events
- ✓ Expression-bodied members

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Advanced C# Part 3

Recursive methods

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Recursive methods

Recursive methods : means a method calling itself.

- ***Recursive method calls itself a number of times until a specific condition happens.***
- ***Recursive method has parameters and each time it calls itself it has a new parameter values.***

Recursive methods

A factorial is a function that multiplies a number by every number below it.

1! = 1
2! = 2(1) = 2
3! = 3(2)(1) = 6
4! = 4(3)(2)(1) = 24
5! = 5(4)(3)(2)(1) = 120

Recursive methods exercise

What is .Net framework?

It is a component of Windows that includes a virtual execution system called the (CLR) Common Language Runtime and a unified set of class libraries.

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Recursive methods exercise

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Params exercise

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Params exercise

Create a method the takes an array (using params) of any datatype and display the items inside of this array

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Local functions (nested functions)

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Anonymous methods

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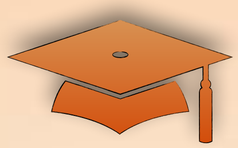

Extension methods

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Extension methods

Extension methods enable you to *add methods to existing types* without modifying the original type.

int x = 0;

CompareTo

Equals

GetHashCode

GetType

ToString

- **An extension method is *defined as static* method but it is *called like as instance method.***
- **Must be created inside a *static class.***
- **The first parameter specifies which type the method operates on, and it is preceded by the "this" keyword.**
- **An extension method having the same name and signature like as an instance method will never be called since it has low priority than instance method.**

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Extension method exercise

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Extension method exercise

Wednesday 1
November 2000

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Stopwatch

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Delegates

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Delegates

A delegate is a reference type variable that holds the reference to a method. Which means delegates allow methods to be passed as parameters.

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Delegates exercise

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Delegates exercise

Create a delegate that takes a dictionary (int, string) as a parameter and display the content of the dictionary

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Multicast delegates

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Anonymous methods

Anonymous method is a method *without a name*. It is defined using the *delegate keyword* and can be assigned to a delegate instance.

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Lambda expressions

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Lambda expressions

Lambda Expression is a shorter way of representing anonymous method.
Lambda expressions use this =>

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Generic delegate : Func

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Generic delegate : Func

Func is a built-in generic delegate, it has up to 16 parameters.
Func has one out parameter.
The last parameter is considered as an out parameter.
Func delegate type must return a value.

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Generic delegate : Action

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Generic delegate : Action

Action delegate is the same as Func delegate except that the Action delegate doesn't return a value

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Generic delegate : Predicate

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Generic delegate : Predicate

Predicate delegate is the same as Action delegate and Func delegate. But it must take one input parameter and returns a boolean value

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Events

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Events

Events are just a user action such as mouse clicks, key pressed and many other more

The events are declared and raised in a class and associated with the event handlers using delegates within the same class or some other class.

Publisher
is an object that contains the definition of the event and the delegate

Subscriber
is an object that accepts the event and provides an event handler

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Assignments(16, 17, 18)

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Assignments

Assignment No.16: (Enhancement of recursive methods exercise)

- **Get the files inside each folder and display its name and its creation date**

Languages : created on (10/7/2017 6:12:38 PM)
c:\files\Languages\Arabic\log.txt : created on (10/7/2017 6:12:55 PM)
Arabic : created on (10/7/2017 6:12:55 PM)
c:\files\Languages\Chinese\log.txt : created on (10/7/2017 6:13:36 PM)
Chinese : created on (10/7/2017 6:13:36 PM)
c:\files\Languages\English\log.txt : created on (10/7/2017 6:12:55 PM)
English : created on (10/7/2017 6:12:55 PM)
United Kingdom : created on (10/31/2017 4:44:51 PM)
United States : created on (10/31/2017 4:44:47 PM)
c:\files\Languages\German\log.txt : created on (10/7/2017 6:12:55 PM)
German : created on (10/7/2017 6:12:55 PM)
c:\files\Languages\Hindi\log.txt : created on (10/7/2017 6:13:36 PM)
Hindi : created on (10/7/2017 6:13:36 PM)

Assignments

Assignment No.17: (Capitalize First Letter)

- Create an extension method to capitalize each letter in a string.

Assignments

Assignment No.18: (Math Operations)

- Using multicast delegate and expression-bodied members perform the 5 basic math operations (addiction, subtraction, multiplication, division and remainder)